PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
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J. DOERING, JR.
PLANT MANAGER
LIMERICK GENERATING STATION

May 1, 1991
Docket No. 50-353
License No. NPF-85

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Special Report
Limerick Generating Station - Unit 2

This Special Report concerns an improperly installed Emergency Diesel Generator potential transformer primary fuse that resulted in a valid test failure during a test simulating a loss-of-offsite power in conjunction with an Emergency Core Cooling System actuation test signal.

Reference:	Docket No. 50-353
Report Number:	2-91-005
Revision Number:	00
Event Date:	April 1, 1991
Report Date:	May 1, 1991
Facility:	Limerick Generating Station P.O. Box A, Sanatoga, PA 19464

This Special Report is being submitted pursuant to Technical Specifications (TS) Section 6.9.2, as required by TS Surveillance Requirement 4.8.1.1.3.

Very truly yours,

JLP:rgs

cc: T. T. Martin, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Limerick Generating Station, Unit 2	0 5 0 0 0 3 5 3	1 OF 0 3

TITLE (4)

Special Report for Diesel Generator Test Failure

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
											0 5 0 0 0
0 4	0 1	9 1	9 1	-	0 0 5	- 0 0	0 5	0 1	9 1		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
5		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 1 0		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Special Report
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
G. J. Madsen, Regulatory Engineer, Limerick Generating Station	AREA CODE 2 1 5 — 3 2 7 - 1 2 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On April 1, 1991, with Unit 2 in a refueling condition, plant personnel were performing Surveillance Test (ST) procedure ST-1-092-111-2, "D21 Diesel Generator 4 KV SFGD Loss of Power LSF/SAA and Outage Testing." The D21 Emergency Diesel Generator (EDG) had been declared inoperable to perform this procedure. The D21 EDG successfully rejected the 2A Residual Heat Removal (RHR) system pump motor load of 992KW. In accordance with the procedure, the 2A RHR pump was restarted; however, the D21 EDG output voltage increased above the acceptance criteria value to approximately 5200 volts. The test was then terminated. The cause of this event was an improperly installed potential transformer primary fuse that may have been due to personnel error. This resulted in a loss of generator output voltage feedback to the automatic voltage regulator. This event is classified as a valid failure. In the event of an actual loss of offsite power, the D22 EDG and D24 EDG were operable to provide adequate power to maintain the reactor in a safe shutdown condition as required by Technical Specifications. All other EDG potential transformer primary fuses were verified to be properly installed. An operator aid will be added onto each EDG cabinet door to caution operators to ensure all fuses are firmly seated in their fuse clips. Because this is the first failure for the D21 EDG, the test interval remains unchanged at 31 days.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 2	0 5 0 0 0 3 5 3	9 1	— 0 0 5	— 0 0	0 2 OF 0 3

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Reporting Requirements:

Technical Specifications (TS) Section 3/4.8, Electrical Power System Surveillance Requirements

TS Surveillance Requirement 4.8.1.1.3, Reports - all diesel generator failures, valid or nonvalid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide (RG) 1.108, Revision 1, August 1977.

TS Section 6.9.2, Special Reports

TS Section 6.9.2 - Special reports shall be submitted to the Regional Administrator of the Regional Office of the NRC within the time period specified for each report.

Description of the Event:

On April 1, 1991, with Unit 2 in the refueling condition with irradiated fuel being handled in secondary containment, plant personnel were performing Surveillance Test (ST) procedure ST-1-092-111-2, "D21 Diesel Generator 4 KV SFGD Loss of Power LSF/SAA and Outage Testing." The D21 EDG had been declared inoperable to perform this procedure. While performing procedure section 6.8, "Emergency Start upon LOCA in Conjunction with LOOP," the D21 EDG successfully rejected the 2A Residual Heat Removal (RHR) system pump motor load of 992 KW. This essentially completed the test. In accordance with the restoration steps of the procedure, the 2A RHR pump was restarted; however, the D21 EDG output voltage increased above the acceptance criteria value to approximately 5200 volts. The Main Control Room operator rapidly responded by opening the D21 EDG output breaker and placing the D21 EDG handswitch to stop and pull-to-lock to shut down the diesel engine. At the same time at the local control panel for D21 EDG, the plant operator pressed the Emergency Shutdown pushbutton after receiving the overvoltage annunciator. The test was then terminated.

Analysis of the Event:

The terminated D21 EDG test was classified as a valid failure using the guidance of RG 1.108, "Periodic Testing of Diesel Generator Units used as Onsite Electric Power System at Nuclear Power Plants," Revision 1, Section C.2.e.(6). A potential transformer primary fuse was found with one end out of the fuse clip.

The D21 EDG would not have been able to provide emergency power to the Division 1 Safeguard Bus while it was declared inoperable; however, TS Section 3.8.1.2 Limiting Condition for Operation was satisfied because D22 and D24 EDGs were

operable at all times. Additionally, D21 EDG successfully passed a twenty-four hour endurance test as well as monthly operability tests in February and March.

Cause of the Event:

The cause of this event was an improperly installed potential transformer primary fuse that may have been due to personnel error. The potential transformer primary fuse was last known to be removed as part of a block on January 28, 1991, to perform the D21 EDG eighteen month maintenance inspection. At the completion of the inspection on February 2, 1991, it is postulated that the potential transformer primary fuse may not have been fully seated in the fuse clip when it was installed. It is possible that a bent ground strap caused sufficient contact with the fuse to pull one end of the fuse from its fuse clip. An independent verification of proper system restoration also failed to detect the improperly installed fuse. Contributing to the failure to detect the improperly installed fuse is obstructed visual observation due to the arrangement of the control panel. The voltage drop from starting the 2A RHR pump motor together with less than adequate contact of the fuse with the fuse clip caused an increased resistance at the fuse clip resulting in loss of generator output voltage feedback to the automatic voltage regulator. The loss of feedback caused the voltage regulator to maximize generator output voltage.

On April 8, 1991, D21 EDG successfully passed Special Procedure SP-109, "D21 Diesel Generator Voltage Regulator Test," which verified proper operation of the voltage regulator and confirmed that the potential transformer primary fuse caused the failure. This problem is limited to the D21 EDG. Although a total of sixteen panels exist for the eight EDGs at Limerick Generating Station, no other EDGs were affected.

Corrective Actions:

The D21 EDG potential transformer primary fuse was properly installed in its fuse clip and the ground strap was repositioned. All other EDG potential transformer primary fuses were verified to be properly installed. Personnel then performed Special Procedure SP-109 to verify proper operation of the voltage regulator and confirm the potential transformer primary fuse caused the failure. Procedure ST-1-092-111-2 was then successfully performed. By June 3, 1991, an operator aid will be added onto each of the sixteen EDG control panels to reference a system procedure that is being written which will provide caution and direction for proper installation of the potential transformer primary fuses. The operator aid and system procedure will also be utilized in the verification of restoration of the fuses. Because this is the first failure for the D21 EDG, the test interval remains unchanged at 31 days which conforms with TS Table 4.8.1.1.2-1 and Regulatory Position C.2.d of RG 1.108, Revision 1, August 1977. This event is being evaluated for reportability due to a recently identified seismic concern and will be reported in a separate LER if necessary.